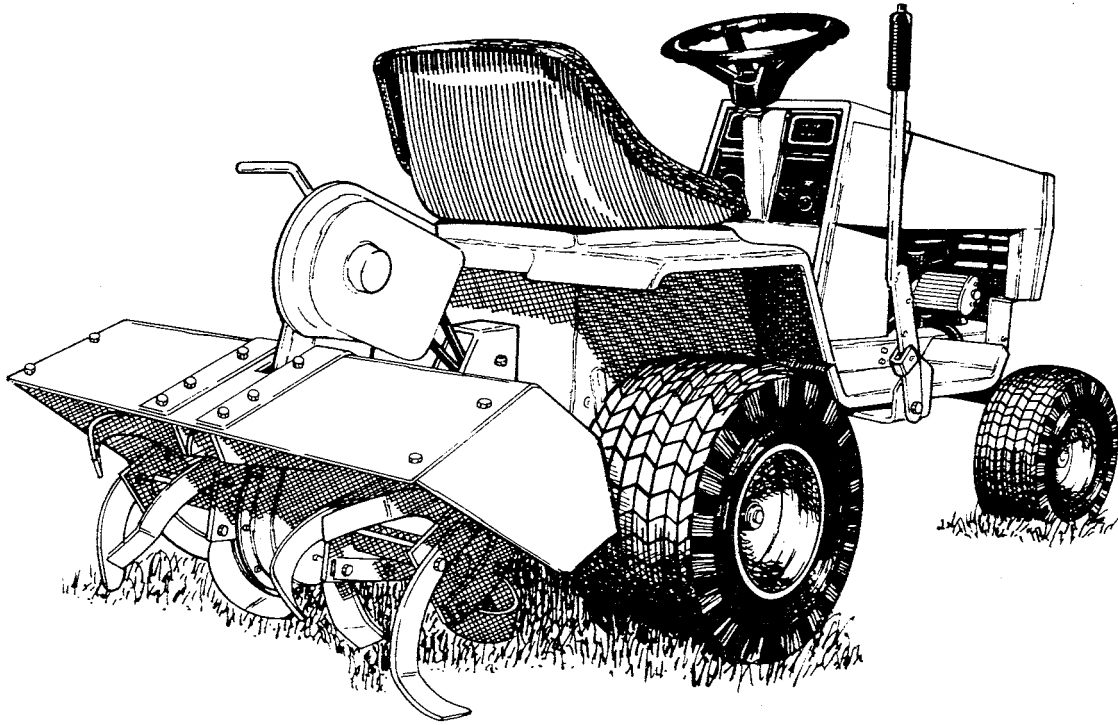
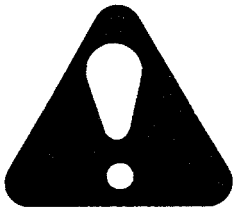


OPERATOR'S MANUAL

MODEL 30" TILLER



30" ROTARY TILLER
MFG. NO. 1690194



**CAUTION: Read Manual Thoroughly
Before Operating**

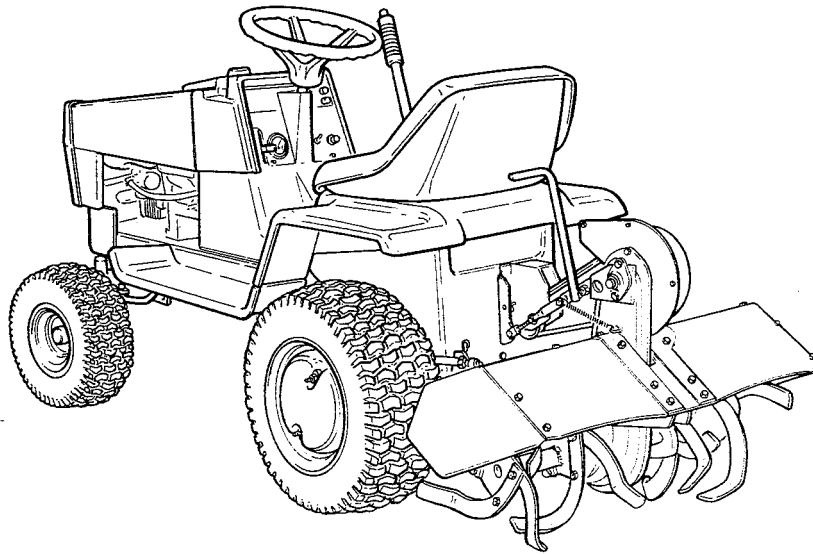


Table of Contents

SAFETY RULES	2
IDENTIFICATION	4
ACCESSORIES AND ATTACHMENTS	4
INSTALLATION	5
REQUIRED ACCESSORY	5
INSTALLATION	5
REMOVAL	6
OPERATION	7
NORMAL CARE	9
SCHEDULED CARE	9
NORMAL STORAGE	9
OFF-SEASON STORAGE	9
MAINTENANCE RECORD	10
TROUBLESHOOTING	11
TROUBLESHOOTING PROCEDURES	11
ADJUSTMENTS	12
ASSEMBLY	13
SPECIFICATIONS	14

Dear Customer,

Congratulations on your purchase of this rotary tiller. It has been carefully designed and built to give you years of dependable service. With proper care, it will help you do your tilling jobs for years to come.

To make sure you get the best use from your rotary tiller, study this manual carefully. Make sure that it is installed properly. Be sure that you (and anyone who operates this machine) know how to use the machine safely. Read this manual and the tractor manual thoroughly and become familiar with the controls of the machine before operating.

For your own safety as well as others, study the safety rules in this manual and those in the tractor manual. Review this information often. It is there for your benefit and is important.

This manual tells how to install, service, and operate your rotary tiller. If any help is needed with any of these procedures, your dealer will be happy to help you.

Measurements are given in this manual with metric equivalents in parentheses. For example, behind the measurement 1/8 inch would appear: (3 mm). So, the metric equivalent of 1/8 inch is 3 millimeters.

These metric measurements are provided for your convenience as an aid in converting to the metric system. A list of metric terms and abbreviations used in this manual is provided below.

LIST OF ABBREVIATIONS OF METRIC TERMS

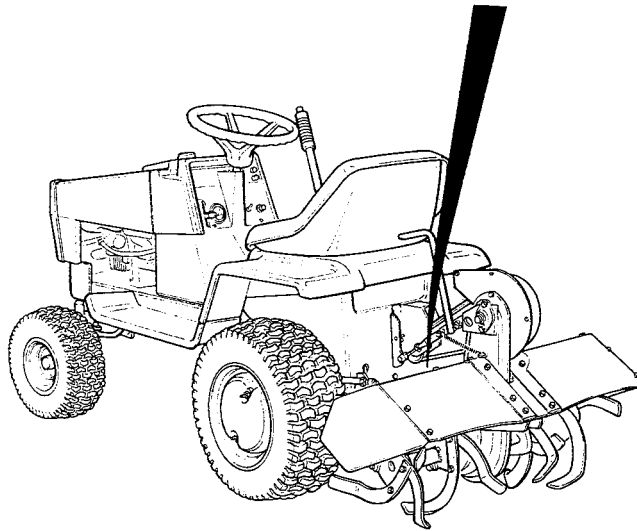
1. mm = millimeter
2. kg = kilogram

Identification

When ordering replacement parts for your rotary tiller, be prepared to give your dealer the identification number found on the identification plate shown below. We suggest that you locate the number and record it below for easy reference.

Refer to i.d. no. when
writing or ordering parts.

I.D. No.



Accessories and Attachments

There are optional accessories and attachments available for your tractor and rotary tiller. See your dealer if you wish to purchase any of the following:

TRACTOR LIFT LEVER — required to raise and lower rotary tiller.

FRONT COUNTERWEIGHT — improves steering ability when rotary tiller is installed.

WHEEL WEIGHTS, REAR — improves traction in wet or loose soil.

HOURMETER — helps insure that scheduled care is done on time.

Installation

CONTENT OF SECTION

Before it can be used, the rotary tiller must be installed on your tractor. This section tells you how the rotary tiller should be installed. It also tells you how to remove the rotary tiller from the tractor.

REQUIRED ACCESSORY

If your tractor is not equipped with a lift lever, a lift lever kit must be bought and installed. See your dealer.

INSTALLATION

Before the rotary tiller can be installed on your tractor, some parts must be assembled onto the tractor. Refer to Assembly Section in this manual for details. Once these assembly tasks are completed, install the rotary tiller on the tractor as follows:

1. Back tractor up to front of rotary tiller. The tiller hitch should be in line with the tractor hitch points.
2. Stop engine, remove key and set parking brake. Be sure tractor lift lever is pushed fully forward.
3. Hook notches (item C, figure 1) in tiller hitch (item E) over pins (item D) on tractor draw bar bracket (item B).
4. Move tiller to align holes and insert hitch pin (item A) through holes in tiller hitch and tractor draw bar bracket. Then install a spring clip through hole in end of hitch pin.

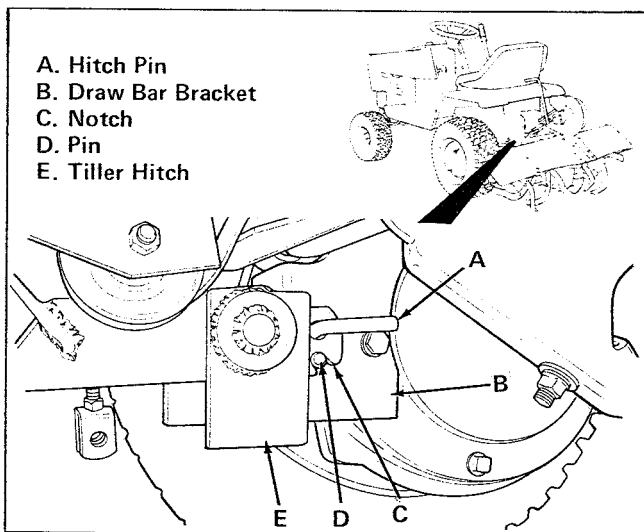


Figure 1. Attach Tiller Hitch to Tractor

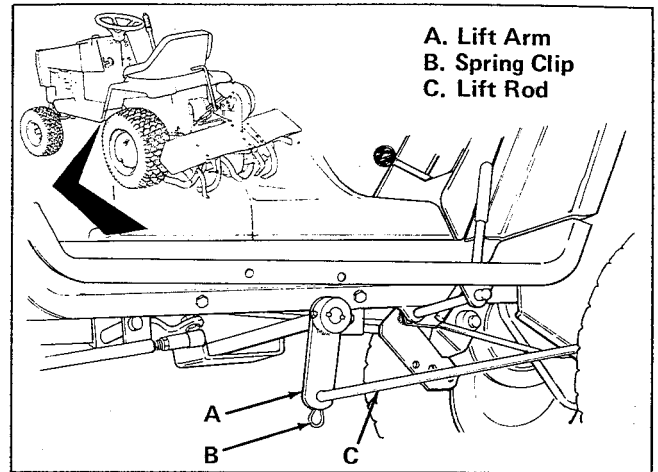


Figure 2. Attach Lift Rod to Tractor

5. Insert curved end of lift rod (item C, figure 2) through hole in tractor lift arm (item A). Then install spring clip (item B) through hole in end of lift rod.
6. Insert rod guide (item E, figure 3) through hole in tiller lift arm (item D). Install spring clip (item F) through hole in rod guide.
7. Be sure that tiller clutch lever is pushed fully rearward.
8. Use pin (item I) with hole near head and a spring clip (item J) to attach pulley support (item A) to bracket (item H) on tractor. Fit holes in pulley support over nuts on bracket and thread tiller drive belt through hole in rear of tractor.

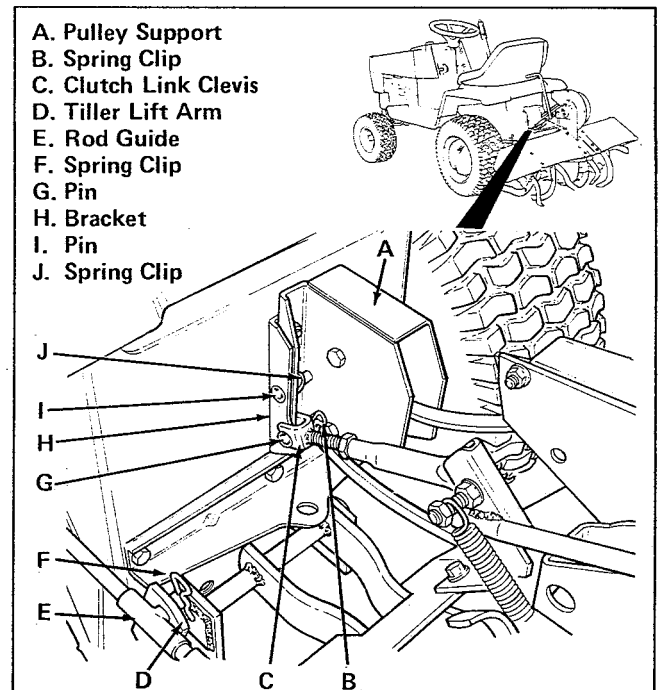


Figure 3. Attach Parts at Rear of Tractor

9. Attach tiller clutch link clevis (item C) to ear on bracket (item H) using a pin (item G) and spring clip (item B).
10. Loosen, but do not remove, nut that secures belt stop (item A, figure 4) for tractor power take-off pulley (item B). This pulley is located under tractor near right rear wheel.

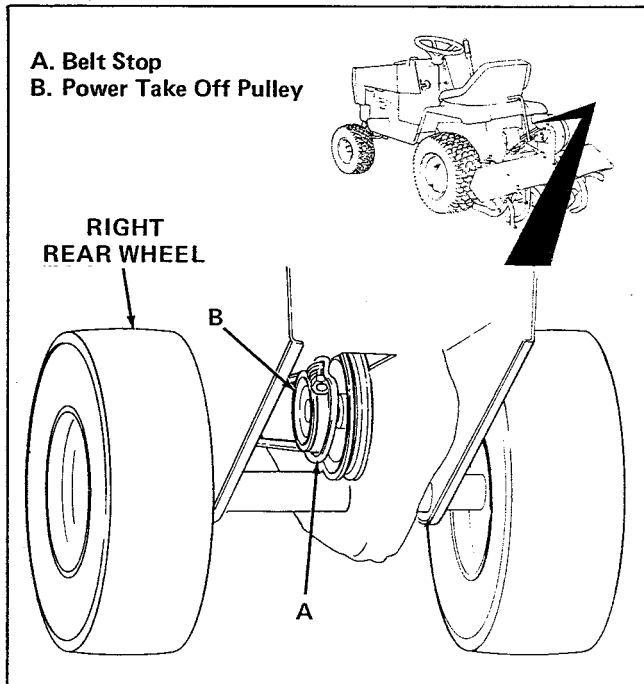


Figure 4. Install Drive Belt on Tractor Pulley

11. Pull rotary tiller drive belt forward and over the tractor power take-off pulley. Be sure belt is not twisted and that it is positioned on pulleys as shown in figure 5.
12. Hold belt stop over groove of tractor power take-off pulley while retightening nut to secure belt stop in place.
13. Check and, if needed, adjust belt tension and lift rod. Refer to Adjustment Section of this manual for details.

REMOVAL

To remove the rotary tiller from the tractor proceed as follows:

1. Disengage tiller clutch by pushing clutch lever on tiller fully rearward. Use tractor lift lever to lower tiller to the ground.

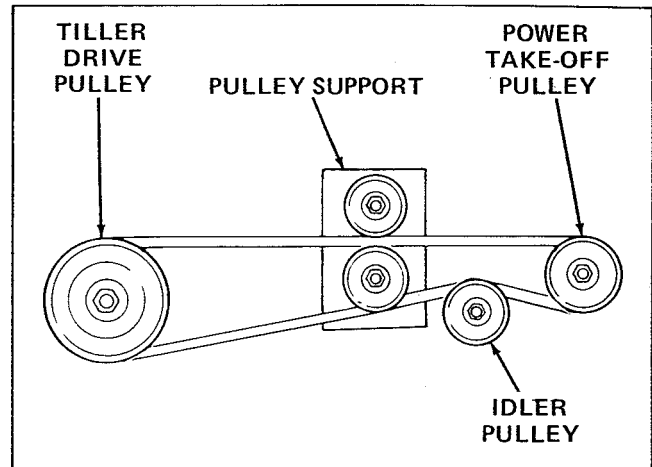


Figure 5. Belt Threading Diagram

⚠ WARNING

Stop engine, remove ignition key and set tractor parking brake before working on or near rotary tiller.

2. Loosen nut that secures belt stop (item A, figure 4). Pull tiller drive belt off tractor power take-off pulley. Then retighten nut to secure belt stop.
3. Remove spring clips (items B and J, figure 3) and pins (items G and I) to detach clutch link clevis (item C) and pulley support (item A) from tractor. To prevent loss, install pins and spring clips in removed tiller parts.
4. Remove spring clips (item F, figure 3 and item B, figure 2) to detach lift rod from tractor. Reinstall spring clips in holes of lift rod to prevent loss.
5. Remove spring clip and hitch pin (item A, figure 1). Then detach tiller hitch from tractor hitch. To prevent loss, install hitch pin and spring clip on tiller hitch.
6. Before moving tractor, be sure that tiller drive belt is pulled completely away from tractor.

NOTE

Leave other items, including pulley support bracket (item H, figure 3), installed on tractor.

Operation

CONTENT OF SECTION

A brief description of the rotary tiller controls, followed by the basic operating procedures, is given in this section to help you get to know your rotary tiller and how to operate it safely and efficiently.

ROTARY TILLER CONTROLS

The rotary tiller is operated using controls on the tractor. Figure 6 shows the locations, names and functions of these controls. The control names given in figure 6 are used throughout the manual.

OPERATING PROCEDURES

The rest of this section tells you how to operate your rotary tiller. The directions assume that both the rotary tiller and tractor work properly. If not, refer to the troubleshooting sections of this manual and the tractor manual.

WARNING

Before attempting to inspect, adjust, or service the rotary tiller make sure the PTO lever is disengaged, the engine stopped, and the key removed.

CHECKS BEFORE STARTING

The checks listed below should be performed before each use of the rotary tiller.

1. Read this manual. Read the tractor operator's manual. Be sure you know safety precautions and locations and uses of operating controls.

2. Check the rotary tiller to insure that it is properly installed on tractor. Be sure that all safety guards are in place and that all nuts, bolts and spring clips are secure.
3. Refer to Normal Care section of this manual to determine and perform any needed care for the rotary tiller. Do the same for the tractor.
4. Clear the area you intend to work in to be sure that it is free of all items that may be caught in or thrown by the rotary tiller.

TRACTOR AND TILLER OPERATION

The tractor supplies both the power and forward motion for the rotary tiller. Therefore, tractor operation is vital to proper rotary tiller operation. Details for rotary tiller operation are given in paragraphs that follow. Read all of these paragraphs. Then read the general operating procedure for tractor operation with attachments given in the tractor manual before attempting to use the rotary tiller.

Raising the Rotary Tiller

Use the lift lever on the tractor to raise or lower the rotary tiller.

Turning or Backing with Rotary Tiller

Before backing up the tractor or turning the tractor sharply, always raise the tiller until it is clear of the ground. Otherwise, the tiller can be damaged.

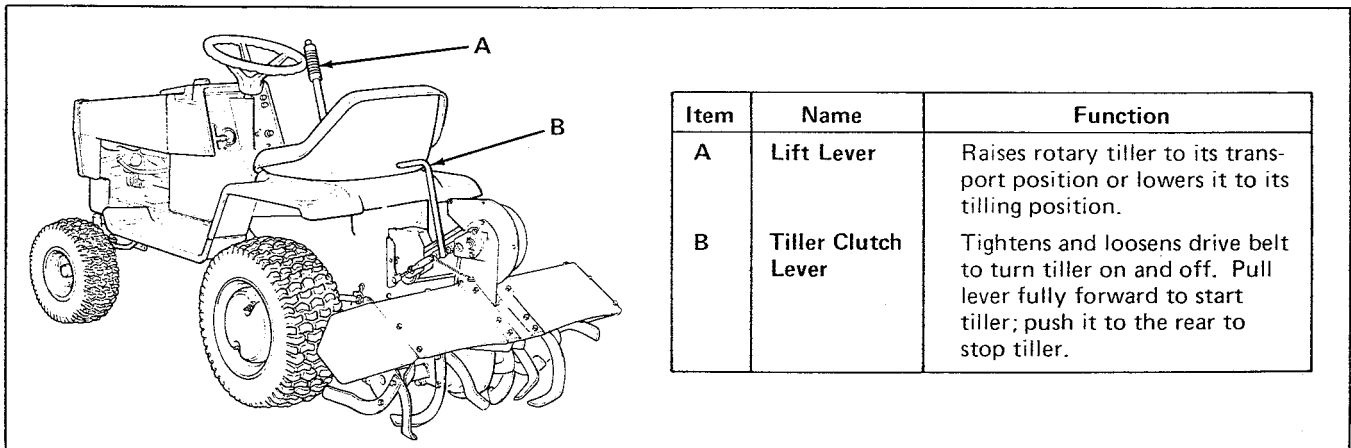


Figure 6. Locations and Functions of Controls

Steering with Rotary Tiller Installed

The weight of the rotary tiller behind the tractor reduces weight on the front wheels. Use of the front counterweight is recommended to restore the normal turning ability of the tractor. Even with the weight installed, avoid "jack-rabbit" starts and adjust the tractor speed to fit the condition of the surface on which you are traveling.

Transporting the Rotary Tiller

When you use the tractor to transport the rotary tiller to and from work areas, the rotary tiller should be fully raised. Also be sure the tiller clutch lever is pushed fully rearward to the disengaged position.

Engine Speed for Tilling

Operate the engine at 3/4 to full speed for normal tilling. Full engine speed will be necessary when tilling depth and ground conditions require full engine power. When tilling sod, 1/3 speed will produce the best results.

Tractor Speed for Tilling

The tractor speed affects the tilling depth and the size of the soil particles. The best speed is determined by the soil conditions and land contours. For most conditions, the best speed is obtained in first gear. You may be able to use second gear in soft, loose soil.

NOTE

After striking a foreign object, stop the engine, disengage PTO, and remove ignition key. Thoroughly inspect the rotary tiller for any damage before restarting.

Stopping the Rotary Tiller

To stop the rotary tiller while it is in operation, push the tiller clutch lever (item B, figure 6) rearward and stop the tractor. Do this immediately if you strike rocks that jam the tines.

Starting the Rotary Tiller

Stop the tractor and lower the rotary tiller. Then pull the tiller clutch lever forward. Select low gear and slowly release tractor clutch pedal. The tines

will dig down to the desired depth as the tractor starts into motion. Check tiller often as you proceed to be sure tines are rotating. If tines stop, stop rotary tiller and tractor immediately. Then shut off engine, remove key and locate and correct problem.

Tilling Patterns

Determine the best pattern before you start. Consider the size and shape of the area to be tilled. The locations of fences or buildings can also affect the pattern.

Usually, it is best to drive back and forth the long direction of the area. By making fewer turns, you can get the job done faster.

For fine seedbed soil, till the area in one direction, then till again at right angles.

Tilling Depth

You will want to till to a depth that suits the seed you will plant. As a rule, till at least 2 inches (50 mm) deeper than the normal planting depth for the seed. The usual planting depth for corn, as an example, is 2 to 3 inches (50 to 76 mm). Using the rule above for this example, till the soil to a depth of 5 inches (127 mm) or more.

CAUTION

On hard ground, the tiller may propel the tractor if tiller depth is set too deep.

If you till too deeply in a single pass, the soil texture will be coarse. The problem can be avoided by making a number of passes over the same area. Till to a shallow depth on the first pass. Then increase the depth on each additional pass until the seedbed has the proper depth and texture.

To control the tilling depth, raise or lower the rotary tiller using the tractor lift lever. Use the first notch of the lift lever quadrant for the first pass. The pin normally located in the forward hole of the lift lever quadrant limits tilling depth for the second pass over an area. Move this pin to the rear hole of the quadrant for full tilling depth on the third pass. Remember that tractor speed and soil condition also affect the seedbed. When the tractor speed is too high, the depth is shallow and soil particles are large. The same results can occur when the soil is too wet or too dry for tilling.

Normal Care

CONTENT OF SECTION

Your rotary tiller was designed and built to provide years of service with only minor care. This care, however, must be performed to keep it in good operating condition and to avoid costly repairs. This section shows you how to provide the necessary care.

SCHEDULED CARE

The only care required for the rotary tiller on a regular scheduled basis is lubrication. The rotary tiller must be lubricated as shown in figure 7 before the first use and after every 4 hours of operation.

A Maintenance Record (figure 8) is provided to help you document all operating hours and maintenance repair actions.

NORMAL STORAGE

To protect your rotary tiller, store it in an enclosed dry area. Clean the tines and body of the rotary tiller to remove excess dirt and plant matter. This can be done easily with a hose.

OFF-SEASON STORAGE

When the rotary tiller is to be stored for 30 days or more, take precautions as follows:

1. Remove rotary tiller from tractor.
2. Clean the entire tiller, including the tine assemblies.
3. Coat the tines with a light film of grease or oil. Coat all other bare metal surfaces with a good quality paint (obtainable from your dealer) or a light film of grease or oil.
4. Lubricate rotary tiller. (See figure 7.)


Symbol	Use	Apply With	Procedure
	SAE 30 oil	Oil Can	Clean indicated area and apply 2 or 3 drops of oil.

Figure 7. Lubricate Rotary Tiller (Every 4 Hours)

Troubleshooting

CONTENT OF SECTION

This section of the manual tells you how to troubleshoot some of the more common and easily corrected rotary tiller problems. The same type of data for the tractor can be found in your tractor owner's manual. For problems not covered in these manuals, it is recommended that you contact your dealer.

TROUBLESHOOTING PROCEDURES

Troubleshooting procedures are provided in figure 9. To use these procedures, first locate the problem description that best describes the trouble that you

have encountered. Check the possible causes one at a time in the order that they are listed. Correct any problems that are found and try to operate the rotary tiller again to see if you have eliminated the trouble.

WARNING

For your safety, do not try to adjust or repair the tractor or rotary tiller while the engine is running. Also, always remove the key from the ignition switch before beginning the maintenance to prevent accidental starting of the engine.

Problem	Cause/Remedy
1. Rotary tiller tines do not rotate.	<ul style="list-style-type: none"> A. Tiller clutch not engaged. Pull clutch lever fully forward. B. Tiller or tractor drive belts too loose. Adjust belt tension. C. Rock jammed in tiller. Remove it. D. Rotary tiller drive belt or chain broken. Replace as needed. E. Drive belt or pulleys oily. Clean as required.
2. Tills too shallow.	<ul style="list-style-type: none"> A. Tiller raised too high. Lower it using tractor lift. B. Engine speed too low. Set engine for 3/4 to full speed. C. Tractor speed too high. Set transmission gear shift for slower speed. D. Ground too hard. Make several passes, tilling deeper on each pass.
3. Tiller leaves ground rough with large clods.	<ul style="list-style-type: none"> A. Ground too wet. Wait until soil does not ball up. B. Tilling too deep at one pass. C. Tractor speed too high. Set transmission gear shift for slower speed.
4. Tractor handles poorly.	<ul style="list-style-type: none"> A. Tractor speed too fast. Use slower speed, especially when running on rough or sloping surfaces. B. Front wheels lifting. Use front counterweight. C. Rear wheels slip. Use rear wheel weights.

Figure 9. Troubleshooting Procedures

CONTENT OF SECTION

This section tells you how to adjust the rotary tiller to keep it operating efficiently. Normally, the adjustment procedures should be performed after installation and thereafter only to correct problems.

WARNING

To avoid serious injury, perform adjustment procedures only when the tractor engine is stopped. Always remove the ignition key before beginning the adjustment procedures to prevent accidental starting of the engine.

ADJUSTMENT PROCEDURES

Belt Tension

To check the belt tension, be sure that the tiller is installed on the tractor and that the tiller clutch is engaged. Then press downward with your thumb at the middle of the exposed part of the belt (item A, figure 10). Thumb pressure should deflect the belt downward about 1/4 inch (6 mm). If not, adjust belt tension as follows:

1. Disengage tiller clutch.
2. Loosen jam nut (item C).
3. Remove spring clip (item F) and pin (item E).

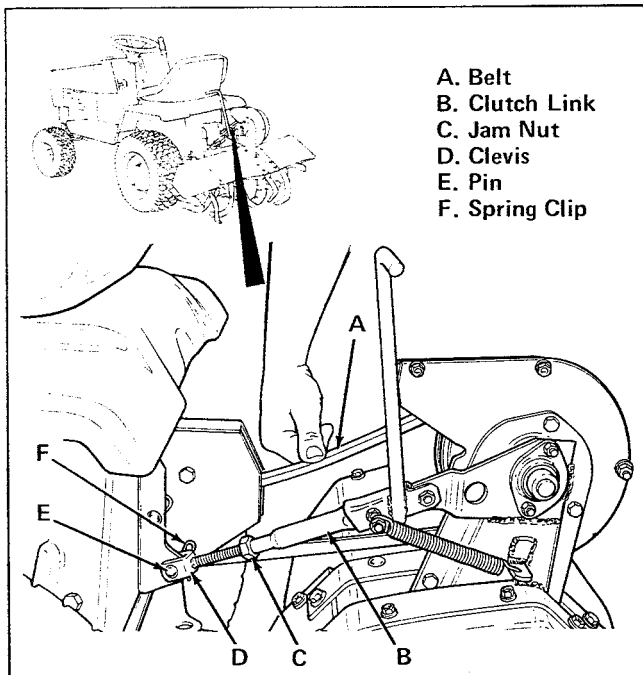


Figure 10. Belt Tension Adjustment

4. Turn clevis (item D) into or out of clutch link (item B). Increasing exposed thread of clevis increases belt tension; decreasing exposed thread decreases belt tension.
5. Reattach clevis (item D) to tractor using pin (item E) and spring clip (item F).
6. Engage tiller clutch. Repeat check and, if needed, adjustment until belt tension is correct. Then tighten jam nut (item C) firmly against clutch link (item B).
7. Operate tiller for short period. Then recheck belt tension.

Lift Rod

The working length of the lift rod can be adjusted by moving the two jam nuts (items B and C, figure 11). Moving these jam nuts affects ground clearance and tilling depth. Ground clearance increases as the nuts are moved toward the rod guide (item A). However, movement in this direction also decreases tilling depth. Initially, position the two nuts so the lift arm (item D) is nearly vertical when the tractor lift lever is pulled fully rearward. This will provide good ground clearance for transporting the tiller. If operation shows that greater tilling depth is needed, move the nuts farther away from the rod guide. To move the nuts, proceed as follows:

1. Use tractor lift lever to lower tiller to ground.
2. Hold forward jam nut (item B) while loosening rear jam nut (item C).
3. Move nuts to desired position on lift rod.
4. Hold forward jam nut (item B) while tightening rear jam nut (item C). The two nuts must be jammed tightly together.
5. Use tractor lift lever to fully raise tiller. Check to be sure that there is reasonable clearance between the ground and the tines.

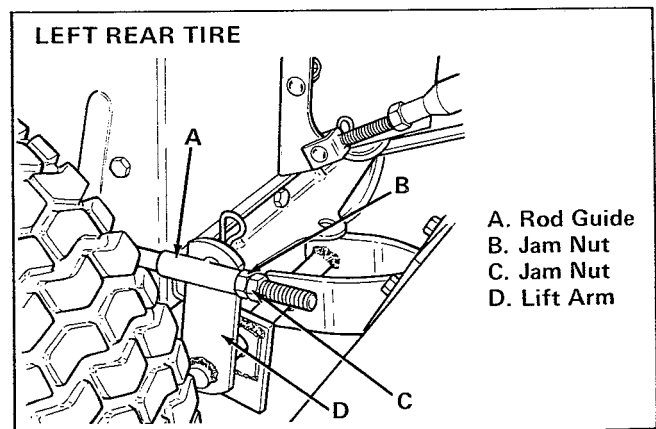


Figure 11. Lift Rod Adjustment

Assembly

CONTENT OF SECTION

The tiller should be received with loose parts that must be assembled onto the tractor. This section tells you how to install these parts.

! WARNING

Stop engine, remove ignition key, and set tractor parking brake before beginning assembly procedure.

ASSEMBLY PROCEDURE

Install Pulley and Belt Stop

Install power take-off pulley (item G, figure 12) and belt stop (item B) on tractor as follows:

1. Install a key in keyway of transmission input shaft (item F). Slip power take-off pulley (item G) over key and shaft with setscrew in pulley hub on outboard side. Be sure pulley hub and key are flush with the end of the shaft. Then tighten setscrew in pulley hub.
2. Reach up through slot above pulleys and insert flanged capscrew (item A) down through hole in tractor frame above power take-off pulley.
3. Install belt stop (item B) on flanged capscrew so it curves over front of power take-off pulley. Secure it by installing a flat washer (item C), a lockwasher (item D) and a nut (item E). Tighten nut at this time only if you intend to run tractor without installing tiller.

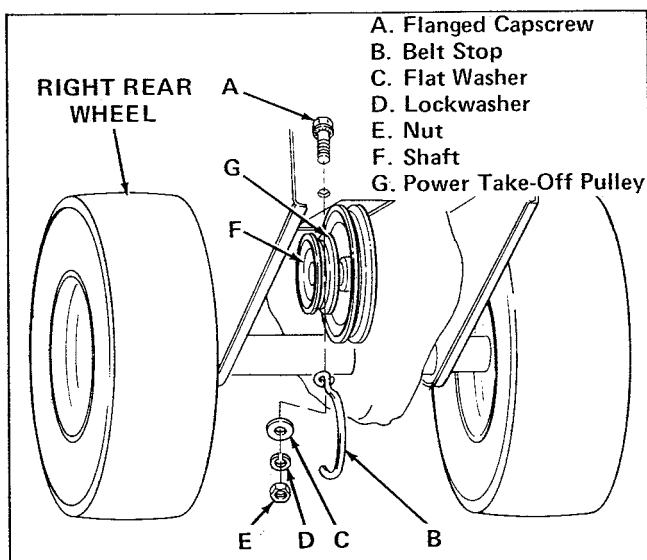


Figure 12. Install Belt Stop

Install Pulley Items

Install pulley items (figure 13) at rear of tractor as follows:

1. Raise seat deck and remove tractor battery. (Refer to tractor manual.)
2. Install capscrew (item C) through hole in back of battery compartment and upper hole of pulley support bracket (item I). Then loosely install lockwasher (item M) and nut (item L) on this capscrew.
3. Install idler pulley (item F) on pulley bracket (item H). Use a capscrew (item G), spacer (item E), two washers (item N), lockwasher (item B) and nut (item A) to secure pulley.
4. Reach through hole in rear of tractor and place pulley bracket (item H) on inside wall. Insert capscrews (item D) through holes in pulley bracket, wall and pulley support bracket (item I). Then install lockwashers (item J) and nuts (item K).
5. Tighten all three nuts (items K and L) to secure pulley support bracket (item I).
6. Reinstall battery and lower seat deck.

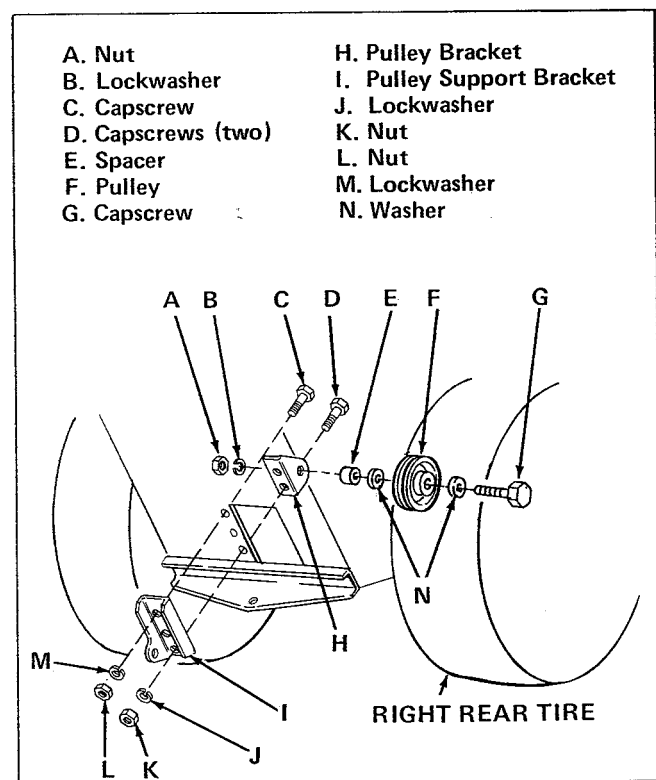


Figure 13. Install Pulley Items

Install Draw Bar Bracket

To install the draw bar bracket (item C, figure 14), remove two capscrews (item B) and lockwashers from right side of the transmission case (item A). Use these capscrews and lockwashers and two more capscrews and lockwashers provided with tiller to attach the draw bar bracket to the transmission case. Check and, if needed, add oil to transmission case. Oil will leak out while lower capscrew is removed.

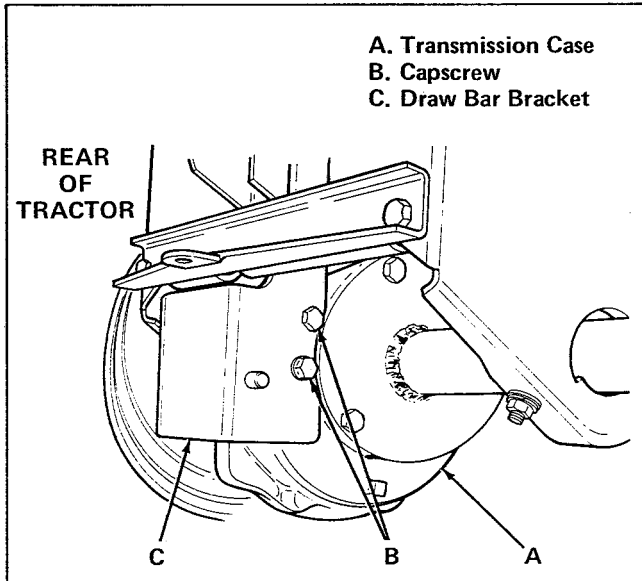


Figure 14. Install Draw Bar Bracket

Install Lift Arm

Install lift arm (item C, figure 15) on tractor lift shaft (item D) as follows:

1. Install two keys (item A) in keyways of tractor lift shaft (item D). The outer ends of the keys should be even with the end of the shaft.
2. Install lift arm (item C) over keys and lift shaft. The hub of the lift arm should be facing outward and should be even with the end of the shaft.
3. Install and tighten two setscrews (item B).

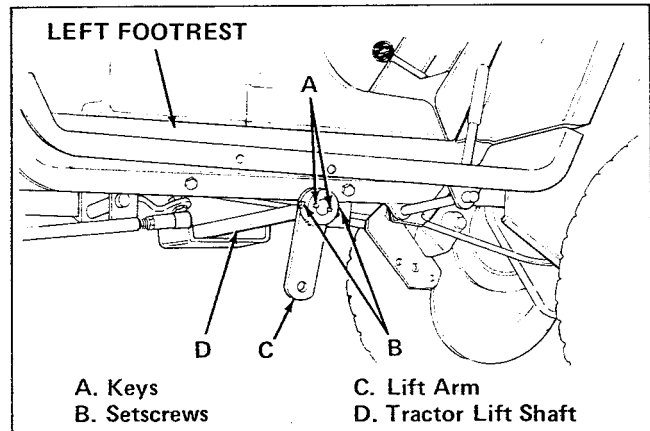


Figure 15. Install Lift Arm

Specifications

DIMENSIONS	Tilling Depth	6 Inches (152 mm) Maximum
	Effective Width	30 Inches (762 mm)
	Overall Width	32 Inches (813 mm)
	Overall Length	24 Inches (610 mm)
	Overall Height	26 Inches (660 mm)
	Transport Ground Clearance	3-3/4 Inches (95 mm) Maximum
	Net Weight	112 Pounds (50 kg)
CONTROLS	Tine Drive	Clutch on Tiller
	Raise and Lower	Tractor Lift Lever
DRIVE TRAIN	Clutch	V-Belt Tensioner
	Input Drive	Cushioning V-Belt from Tractor
	Final Drive	Roller Chains
CHASSIS	Hitch	Welded Steel
	Bearings	Rolling Contact
	Housing	Stamped Steel
	Number of Tines	16 Replaceable Tines